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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/774,869	02/09/2004	Song-Hua Shi	884.698US2	8825
21186	7590	04/21/2006	EXAMINER	
SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A. P.O. BOX 2938 MINNEAPOLIS, MN 55402			MATISIAK, JENNIFER E	
			ART UNIT	PAPER NUMBER
			2811	

DATE MAILED: 04/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

RD

<b>Office Action Summary</b>	Application No. 10/774,869	Applicant(s) SHI ET AL.	
	Examiner Jennifer Matisiak	Art Unit 2811	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1, 3-5, 7, 8 and 17-26 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1, 3-5, 7 and 8 is/are allowed.
- 6) ☒ Claim(s) 17-24 is/are rejected.
- 7) ☒ Claim(s) 25 and 26 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. ____.  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>02/06/2004</u> .  | 6) <input type="checkbox"/> Other: ____.                                    |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

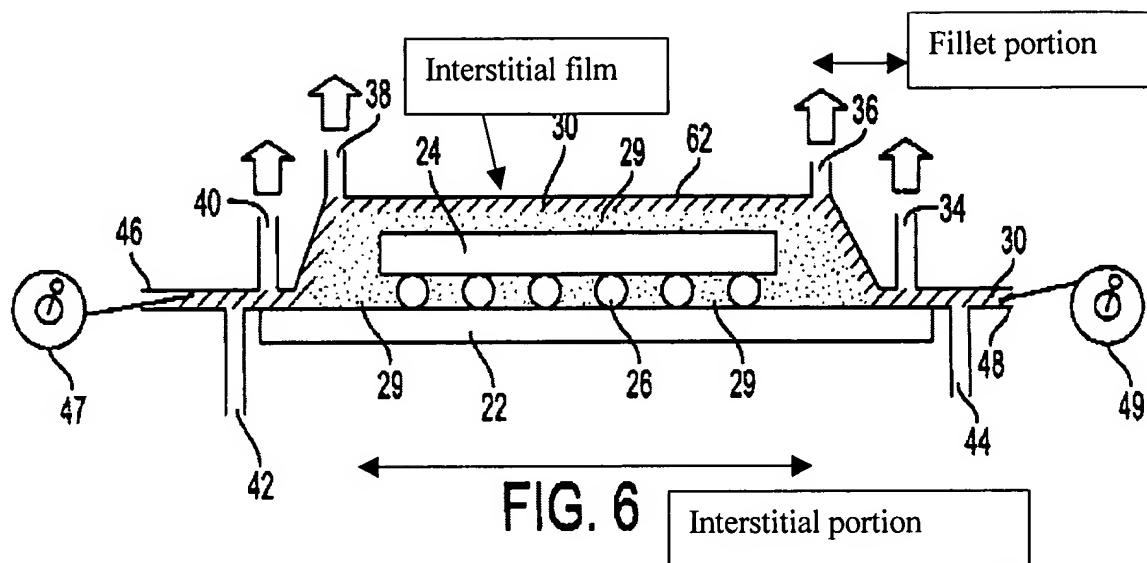
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 17-18, 20, 22-23 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated over Chee et al. (US 6,514,797), hereinafter Chee.

Regarding claim 17, Chee discloses a chip package (Fig. 6, for example) comprising: die (24); a mounting substrate (22); an electrical connection (26) disposed between the mounting substrate and the die; a cured underfill material (29) including a fillet portion (see figure below), and an interstitial portion (see figure below) disposed between the die and the mounting substrate wherein the fillet portion includes a surface roughness and pattern that is characteristic of an interstitial film (see figure below) surface roughness and pattern.



Regarding claim 18, Chee discloses a chip package (Fig. 6) wherein the interstitial film surface roughness and pattern is derived from a film (30) selected from a non-tacky film (col 5, lines 25-26, 30).

Regarding claim 20, Chee discloses wherein the fillet portion (see figure above) exhibits a controllable footprint (Fig. 8) on the mounting substrate (22 of Fig. 6).

Regarding claim 22, Chee discloses a chip package (Fig. 6) wherein the electrical connection (25) disposed between the mounting substrate (22) and the die (24) is selected from a ball grid array (col 3, lines 12-18).

Regarding claim 23, Chee discloses a chip-packaging process system (Fig. 6) comprising: a die (24); a mounting substrate (22); an electrical connection disposed (25) between the mounting substrate and the die; a tacky film (30) that is disposed over the die and stretched onto the mounting substrate; a mold press (20 of Fig. 1) that gives a shape; an underfill material (29) disposed between the die and the mounting substrate;

and an underfill inlet and outlet system (52 of Fig. 2, 34, 36, 38, 40 of Fig. 3) that communicates through the film.

Regarding claim 24, Chee discloses a chip package (Fig. 6) wherein the underfill inlet and outlet system (52 of Fig. 2, 34, 36, 38, 40 of Fig. 3) includes an underfill conduit (52) and a vent (34, 36, 38, 40 of Fig. 3).

2. Claims 17, 19, 21 are rejected under 35 U.S.C. 102(e) as being anticipated by applicant's Admitted Prior Art (APA ).

Regarding claim 17, Admitted Prior Art (APA ) shows a chip package (Fig. 1A, for example) comprising: die (12); a mounting substrate (14); an electrical connection (16) disposed between the mounting substrate and the die: a cured underfill material (18) including a fillet portion (23), and an interstitial portion (24) disposed between the die and the mounting substrate wherein the fillet portion includes a surface roughness and pattern that is characteristic of an interstitial film (28 of Fig. 2A) surface roughness and pattern.

Regarding claim 19, APA shows a chip package (Fig. 1A) wherein the fillet portion (23) exhibits a single-stage solidification profile in cross section.

Regarding claim 21, APA shows a chip package (Fig. 1A) wherein the fillet portion (23) exhibits a concave curvilinear cross-sectional profile (20, 21).

***Allowable Subject Matter***

3. Claims 1, 3-5, 7-8 are allowed. No prior art on record or combination thereof teaches the limitation "wherein after beginning curing the underfill and removing the film, curing includes heating the package in a curing oven under conditions to cause the tacky film to release from the flip-chip assembly."

4. Claims 25-26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

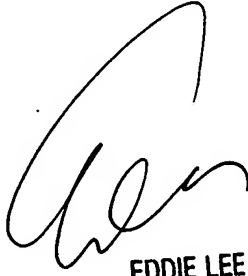
### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer Matisiak whose telephone number is 571-272-2639. The examiner can normally be reached on Business Days 9:30a-6:30p EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on 517-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JEM



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SUPERVISORY PATENT EXAMINER  
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